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Lambda 1405 from lattice QCD

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In this work we present ongoing work for the study of the two pole structure of the Λ (1405) baryon at the $SU(3)$ point. We construct the interpolation operators from the direct product of the pseudo-scalar meson and baryon octets. In these combinations the singlet and octet representations of the $SU(3)$ symmetry are attractive, so we choose the states belonging to this representation with the quantum numbers of the Λ (1405): S=-1 and I=0. Then, we aim to implement a distillation procedure to extract the discrete energy spectrum and, eventually, use it to extract the scattering amplitudes and obtain the location of the poles in the complex energy plane.

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